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ABSTRACT

Three areas of importance to computer coordinators in the schools are: support by walking around, nuts-and-bolts support, and the computer coordinator as policy maker. A day spent following a computer coordinator around an elementary school was examined in the context of a larger qualitative study in which various aspects of support for technology at the school were observed for a little more than one school year. Data for the case study came from a day spent with the part-time computer coordinator of Burnham Elementary School, during the 1993-1994 school year. The computer coordinator can be technician, trainer, curriculum consultant, curriculum designer, and policy-maker. Support by walking around can facilitate these roles by making the computer coordinator aware of technical problems and training needs, how the computer can support the curriculum, and the effects that policy decisions can have on different teachers. The report suggests that teacher educators need to understand that computer coordinators need strong technical skills and the ability to provide basic training because these roles are likely to be significant parts of their jobs. A computer coordinator with a good understanding of the change process can help to set policies that enable technology to help change schools in positive ways. (AEF)

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Supporting Technology in Schools: The Roles of Computer Coordinators

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In this paper, three areas of importance to computer coordinators in the schools are discussed: support by walking around, nuts-and-bolts support, and the computer coordinator as policy maker. I also analyze a day spent following a computer coordinator around an elementary school. That single day is examined in the context of a larger qualitative study in which various aspects of support for technology at Burnham Elementary School (all names in this paper are pseudonyms) were observed for a little more than one school year.

The computer coordinator may serve several roles, but the most dominant is meeting the immediate needs of teachers. This role is facilitated by a style of support which I call "support by walking around." Support by walking around includes any support given by virtue of being in the right place at the right time. Support by walking around was the computer coordinator's main method of serving the immediate needs of the faculty, and it was his best avenue for gathering information about technical and policy issues.

The computer coordinator felt his work was mostly "nuts-and-bolts." Nuts-and-bolts activities include tasks that require the expertise of a technician, which typical educators or administrators lack. The issue of nuts-and-bolts activities is significant because it consumes the majority of the time of the computer coordinator. On the surface, this would seem to imply that technicians should fill the role of computer coordinators. However, many activities, like training, are enhanced by someone who understands the classroom and the needs of the classroom teacher and can tie the activity into the context of the larger curriculum. Support by walking around also helps computer coordinators become knowledgeable about technology related issues in the school and helps them understand school-wide policy issues relating to technology.

This leads to the last area of concern for computer coordinators—computer coordinators as policy-makers. Although no major policies were made the day I spent with the computer coordinator, many of his activities were impromptu discussions about school technology policy. While many of the functions of the computer coordinator could be performed by a technician, the computer coordinator as educator and policy-maker has an opportunity to make a significant difference in the way the school uses technology to enhance the learning environment.

This study is an examination of the roles of computer coordinators and the ways that those roles go beyond technical nuts-and-bolts support. As a case study, this paper does not answer this question for all situations, but it helps to build an understanding of how a computer coordinator can function.

The Computer Coordinator in the Literature

Change processes and change agents in schools have been widely studied (e.g., Hall & Hord, 1987; Firestone, 1989; Fullan & Stiegelbauer, 1991). Others have looked specifically at computer coordinators. Strudler (1991) studied three elementary school computer coordinators and their roles as change agents. In his study, the computer coordinators ran programs in a laboratory separate from the regular classrooms; Burnham's computers were distributed among the classrooms. In each case, the goals were the same: integration of the computer into the teachers' curricula. The goal was better achieved when the computer coordinator became involved in the curriculum of the classroom and helped teachers see the value of teaching with computers. Most of the computer coordinators' work centered on immediate needs: for Burnham that was nuts-and-bolts activities, and for Strudler's cases that was the separate curriculum of the computer classroom.

Moursund (1985) also discusses the job of the computer coordinator. He emphasized a variety of skills necessary to be an effective computer coordinator including: general dedication to education and good managerial skills; specific knowledge of the educational system—including good teaching skills and an understanding of educational change; communication skills—with an emphasis on being a good listener; and technical knowledge in computer science and computer education—including knowledge of

teaching and learning theory as they relate to the computer field. While nuts-and-bolts knowledge is hinted at in several of the areas, Moursund's emphasis is on educational and managerial skills.

Loucks and Zacchei (1983) discuss support for innovations in schools. They state that a successful innovation requires a local facilitator, acting as ". . . cheerleader, building commitment early and maintaining it through constant encouragement; linker, bringing in outside expertise and ideas and linking resources and expertise within the district; and trouble-shooter, helping teachers solve problems and maximize their efforts. . .." (p. 29) The local facilitator is a school-based contact for a single project or innovation that involves many schools. The computer coordinator assumes this role for a wide range of computer-related innovations. In Burnham's case, Robert mainly saw his role as trouble-shooter, but the greatest success with the computer was achieved when someone, either Robert or the classroom teachers, took on the other roles.

Research Methodology and Procedures

This paper describes a case study that was part of a larger ethnographic study which looked at various aspects of support for technology in Burnham Elementary School, concentrating on three 3rd and 4th grade classes. I spent most of my time with these three classes and their teachers. I also looked more broadly at the 3rd/4th grade of Burnham Elementary School, the school in general, and the district.

Burnham Elementary School is a midwestern, public K-5 school with 19 classroom teachers and approximately 400 students. The school had an unreliable connection to the Internet, one computer in most of the 3rd, 4th, and 5th grade classrooms, a few computers shared by the 1st and 2nd grade classrooms, one older computer in each of the kindergarten classrooms, and one higher-end computer in the library with a networked printer and a scanner.

My qualitative methodology was shaped by situated-evaluation (see Bruce, 1993). In situated-evaluation, innovations are viewed as part of existing situations. Instead of viewing the innovation as a separate entity, it is part of the existing social system. Situated-evaluation techniques help us understand why support does not always meet its objectives. A situated-evaluation approach might find that the support was inadequate because the designers of the support did not account for the contexts and constraints of the situation, or it might bring about a better understanding of how the situation and the support interact to provide different support than what was originally intended.

Data for this case study came from a day that I spent with Robert, the part-time computer coordinator of Burnham Elementary School, during the 1993-1994 school year. I took notes about what I observed and expanded my notes through reflection over the next couple of days. As I read and reread the notes, I became aware of certain themes of interest, including: nuts-and-bolts support, support by walking around, and policy issues. I carefully coded each interaction for these themes, and I reread the notes several times, keeping these themes in mind.

The data from the single day with Robert was bolstered by the larger study. Before and after the day with Robert, I was able to observe him for brief periods and discuss issues relating to the computer coordinator job. Discussions were held with Robert, and other teachers in the school, and included formal interviews and informal conversations. The near-1000 pages of field notes from the larger study were coded, to enable extraction of any notes that related to the computer coordinator and analyze them in conjunction with notes from the day of observation.

The data from the larger study was supportive of what I saw during the day with Robert; however, at Burnham Technology Committee meetings, I was able to gain a better understanding of the potential impact of the computer coordinator on school policy.

A Day With Robert

Robert worked 15 hours per week as the part-time computer coordinator for Burnham Elementary School. I spent a day with him on Tuesday, December 7, 1993. In this section, I will discuss my observations and impressions of Robert's activities during that day and highlight the issues of: nuts-and-bolts, support by walking around, and the computer coordinator as policy maker.

I arrived at Burnham Elementary School at 8:15 a.m. and went to the library to meet Robert. He does not have an office and his desk in the library serves as a "home base." The library is frequented by teachers and students and is a convenient place for him to interact with others. Being situated in the library is also useful because it enables him to spend time discussing technology and school-related issues with Jackie, the librarian.

Before beginning his tasks, he talked to Jackie the librarian about the technology items that had been discussed at the faculty meeting the previous day. Then, they talked about other technology policy issues, including what to do about a modem that two teachers needed as part of the Global Schoolhouse Project. They discussed whether the modem should go in the classroom that the two teachers shared or in the library to be accessed over the network.

After Jackie left, Robert explained to me some of the issues involved with this double classroom. These teachers have four computers and will be getting more as part of the Global Schoolhouse Project. They do a lot with technology, but there is some resentment on the faculty about all the "goodies" that they have. Robert explained that part of the technology comes from grants, and part of it comes from the fact that their classroom is separated from the rest of the school by a small staircase, making it more difficult to share

equipment (such as a computer on a cart) with other classrooms.

Robert then tried to check his e-mail. Since the school's Internet connection was not working, he needed to use a modem, and for that, he lacked a piece of software. He thought that Cheryl, a 4th/5th grade teacher, might have the software. This afforded him the first opportunity to walk around.

Another item on Robert's agenda was an inventory of all the hardware in the school, including locations and serial numbers. Completing the inventory gave him a second opportunity to walk around.

The Burnham Technology Committee had decided to buy a hard drive for the secretary in the front office and two AppleTalk cards to allow two printers to be shared over the network. Robert was responsible for this, and it required him to go talk to the secretary in the front office a few times—yet another opportunity to walk around.

At about 8:45 a.m., Robert left the library to go talk to the secretary in the front office about the equipment he needed to order. On the way, he bumped into a teacher and told her that he would be getting some shareware for the computer she had just gotten in her classroom. He also spoke briefly with the chair of the school Technology Committee. When he got to the office, he discussed the paperwork necessary for buying the parts he needed. On the way out of the office, he spoke to another teacher who told him that her computer had not worked since Friday. He accompanied her to her classroom and fixed a simple problem. She also told him that she had just taken a workshop about ClarisWorks, and asked if she could get it installed on her computer.

During this brief period of time, Robert went to the office to work on one problem, and addressed issues with three teachers. In the first case, he reminded a teacher, whom he had not seen in several days, that he would be helping her in an effort to bolster her enthusiasm about her new computer. He then connected with the chair of the Technology Committee to maintain his awareness of what was happening in the school. Finally, he solved a problem that could have persisted for several days had the teacher not made him aware of it.

On the way back to the library, Robert walked by a 5th grade teacher outside her classroom. They discussed some personal matters and talked about the ClarisWorks training that she and another teacher had attended. She said that the training was at ESC (a state-funded regional training center for schools) and funding for ESC was changing so ESC might not offer as much training the following year. This encounter helped Robert in his role as policy maker and as local facilitator.

Robert continued on his way back to the library and again talked to the chair of the Technology Committee. They walked together down the hall and discussed some network software. When he had made it back to the library, he called a computer store to find the price for the parts he needed. He then spoke with the librarian for a couple of minutes and went to the front office to give the secretary price information about the needed parts.

At 9:25, Robert returned to the library. He sorted through some things on his desk, putting some things in a folder he had created for articles of interest, including a magazine that contained a review of some of the best software. He said that he intended to make this folder available for all the teachers.

Robert told the librarian about the teacher who wanted ClarisWorks. They discussed looking into how many copies they had and who was using it. They also discussed getting copies of the handouts from the ClarisWorks workshop that two teachers had attended and make them available to other teachers.

This interchange between Robert and the librarian brings out an important role of the computer coordinator that goes beyond nuts-and-bolts. Teachers have a limited opportunity to interact with other teachers and with the district office. Some teachers, such as Jennifer, feel more isolated than others:

> She said that she feels like she is alone with these problems. She's not sure if anyone else is in the same position as she is with the computer. She said she knows Sarah and Cindy [two other teachers at her grade level] are more advanced than she is. (field notes, 1/13/94)

One role that Robert played was to be a liaison between teachers and teachers as well as between teachers and the district. Jennifer might have little opportunity to communicate with many other teachers, but does communicate with Robert due to the nature of his role.

During the rest of the day, Robert was engaged in a variety of activities in which he:

1. walked around the school collecting data for the hardware inventory;
2. worked in the library on the software inventory;
3. ate lunch with several teachers and discussing technology;
4. loaded shareware on a teacher's computer;
5. discussed policy issues with the librarian and chair of the Technology Committee;
6. went to a classroom to look for some software he needed and helped the teacher fix an E-mail problem;
7. answered a technical question for the principal;
8. discussed the status of the network with a teacher;
9. found a printout at the printer that included several blank pages and discussed ways to prevent this from happening;
10. arranged times to provide individual training for two teachers;
11. helped schedule the use of the computer in the library;

12. told a teacher how to fix a software problem when she came to the library to pick up her work from the printer;
13. arranged to help out as a technical consultant for a special program in the school; and
14. answered questions over the phone for a teacher who was home sick.

His day was filled with nuts-and-bolts, discussions with teachers about various things and at various levels of importance, walking around and talking with people, and working and talking with people in the library. Most of the things he did were not of great importance when viewed individually, but taken as a whole, his pattern of contact with teachers—finding out about their needs, fixing their problems, and discussing their policy concerns—was very important.

Discussion: Nuts-and-Bolts, Walking-Around, Policy-Making

I looked carefully at the ideas of nuts-and-bolts and walking around. Nuts-and-bolts included things that a technician could do like: fixing equipment, installing hardware or software, ordering hardware or software, and cataloging hardware or software. Other activities included setting or discussing policies and developing curriculum (from planning lessons with or for teachers to finding appropriate technology for teachers). Training has elements of nuts-and bolts, but can involve instructional and curricular issues. Teaching basic computer skills and basic word processing can be considered a nuts-and-bolts activity; however, when a curriculum-oriented person includes suggestions for classroom applications, basic training can go beyond nuts-and-bolts.

Walking-around support included any support given by virtue of being in the right place at the right time. This included meeting people in hallways or at mailboxes, teachers who came to the library for another reason but relayed a need when meeting the computer coordinator. Non-walking-around support included planned activities in which the supporter or the supported goes to a place for the specific purpose of giving or getting support.

Robert started the day by reminding me that most of what he does was nuts-and-bolts. On that day, I counted 50 specific instances of supportive activities. Of those, 37 were classified as nuts-and-bolts activities. Most of the other 13 activities could be broadly defined as nuts-and-bolts as well.

Although Robert spoke about an interest in being more involved in curriculum, his most significant non-nuts-and-bolts activities involved influencing policy at the school level. His main influence came directly from his position on the Burnham Technology Committee, but his unique policy influence came from the insights he gained as he discussed policy issues with people from around the school.

In terms of policy, and in terms of direct support, personal contact is very important. Robert could better discuss these policy issues because of the personal contact he had with teachers. In addition, he was able to provide more direct support because of the personal contact he made; that is, he was more aware of the teachers' needs and better able to help them.

Of the 50 supportive activities on the day I followed Robert, I classified 22 of them as walking-around. That is, nearly half of the supportive things he did that day were unplanned. Several of the planned activities were a result of finding out about needs from earlier times when he had walked around. Many of the examples above showed Robert on his way to perform a task, encountering someone who discussed a policy issue with him or told him about a need for support.

Walking around and working directly with many teachers helped him to understand what was relevant to them, This included school-wide policy issues like equitable distribution of equipment, and specific concerns of teachers like the need for student typing skills and assistance. Typing skills is an example of an issue that is not necessarily obvious without continuous contact with teachers. This lead to issues that affected the entire school like when, if ever, keyboarding and typing skills should be taught.

Although Robert's work was mostly nuts-and-bolts, it went beyond that, especially in the area of policy. For some teachers, the nuts-and-bolts work was critical to maintain inspiration. In particular, teachers who were not very inspired to use technology, such as Jennifer, required nuts-and-bolts assistance to use it at all. Some teachers will find ways to get around minor technical problems and remain inspired in the face of adversity. Walking around becomes critical for less inspired teachers who may ignore the problem and refrain from using the computer until the solution comes to them.

Conclusion

Robert's work consisted mostly of nuts-and-bolts support, including solving technical problems and basic training. Although advanced training and curricular support were goals, the most significant support beyond nuts-and-bolts was in the area of policy. All of the support that Robert offered was helped by walking around the school and informally supporting teachers who needed help or wanted to discuss issues with him.

The computer coordinator can be technician, trainer, curriculum consultant, curriculum designer, and policy-maker. Support by walking-around can facilitate all of these roles by making the computer coordinator aware of technical problems and training needs, providing suggestions for how the computer can support the teachers'

curriculum, and the effects that policy decisions can have on different teachers.

We can learn a great deal about the potential of the computer coordinator from Robert. He maintained the technology infrastructure of the school and helped with basic training of teachers. His influence on curriculum and policy was not substantial, largely limited by his part-time status. He was in the best position in the school to understand the technological needs of the teachers, bring them new ideas, link teachers with each other and with resources outside the school, and discuss policies that affected all teachers at the school.

As teacher educators, we need to understand that computer coordinators need strong technical skills and the ability to provide basic training because these roles are likely to be significant parts of their jobs. If we want computer coordinators to influence policy and curriculum, they must have experience in these areas. Computer coordinators with an understanding of curriculum can link ideas from within and outside school. A computer coordinator with a good understanding of the change process can help to set policies that enable technology to help change schools in positive ways.

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